

It is instructive, therefore, to call attention to a recent study by Matkovic and co-workers,⁵ describing two ethnically and occupationally similar communities in Yugoslavia. One habitually received a high calcium intake, and the other low. Residents of the high-intake village had substantially greater bone mass and, more to the point, substantially fewer hip fractures, particularly among the elderly residents.

More such epidemiological work needs to be done; further, other questions need to be answered, such as required dose and bioavailability of various calcium forms. Thus, it would be premature to make any sweeping recommendations about calcium use as prophylaxis. Nevertheless, in view both of the cited studies and of the greater relative safety of calcium over estrogen, this alternative deserves more attention than Dr. Specht gave it.

In closing, it must be stressed that osteoporosis appears to be a very heterogeneous disorder, and that postmenopausal women themselves do not respond uniformly to any prophylactic intervention. No one regimen is likely to work for all, and it would be unrealistic to expect that it would. Nevertheless, as the practicing community faces the dilemma of how to approach prophylaxis in postmenopausal women, it must be said that calcium offers a number of attractive features.

ROBERT P. HEANEY, MD
Vice President for Health Sciences
Creighton University
Omaha, Nebraska

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Dr. Specht Replies

TO THE EDITOR: I suspect that Dr. Heaney and I do not really have any fundamental differences regarding the desirability of calling the attention of the medical profession to this serious and unresolved problem. It is evident from both our works that we are laboring in the same vineyard.

I do take some exception, however, to certain of Dr. Heaney's statements. First, the comment

that there is no clear relationship between bone mass and fragility. Dr. Heaney states, "Many women without hip fracture have no more bone mass than those with fracture. No one knows why this is so." I think this notion is a consequence of focusing too much attention on the altered physiology and not enough on the biomechanical aspects of fracture. The very same statement could be made, for instance, with regard to fractures of the femur in young athletes. Those who fracture their femurs playing football have no more bone mass than those who do not. The answer in both instances, of course, is that the unfractured bone simply has not yet had applied to it sufficient force to exceed its mechanical strength. There are obviously many variables in the application of stresses to bone and our comprehension of this entire area is currently rudimentary.

Second, Dr. Heaney states, "I believe it unlikely that the Food and Drug Administration will approve long-term, routine use of estrogen for the prevention of age-related bone loss in *unselected* postmenopausal women. . . ." This is very likely lamentable, everything, including proper dosage, considered. Furthermore, we do, in fact, have the methods to identify women at risk today, and additional screening techniques are in experimental stages at the present time. It is possible by utilization of photon absorptiometry with iodine 125 or americium 241 to determine bone mineral in vivo. Simpler although perhaps less accurate techniques, using radiologic measurements of cortical bone thickness have been described by Garn, Smith and Walker, and H. E. and S. Meema. Bloom and Laws have shown that combined cortical thickness of bone fell steadily after the age of 50 years, and this is, no doubt, yet another manifestation of the process which leads to skeletal fragility.

My apologia to Dr. Heaney for failing to cite his calcium balance studies in perimenopausal women is simply that there were many biochemical studies that I purposely avoided in my effort to concentrate on the biomechanical aspects of this problem. The paper as presented would not likely have been written by an internist, nor could I do a competent job in addressing the nuances of the biochemistry of this problem. There is no necessary correlation, after all, between alterations in calcium balance in postmenopausal women and ultimate skeletal fragility.

In my view there may well be a cause-and-

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effect relationship, but it has not been satisfactorily demonstrated as yet, with the exception of the single study, cited by Dr. Heaney, of Matkovic and his co-workers in which a high calcium intake was, in fact, shown to reduce the incidence of hip fractures. I have no problem with utilizing any and all techniques for minimizing skeletal fragility in postmenopausal women. I do have some reservations, however, about accepting Dr. Heaney's final statement that "it must be stressed that osteoporosis appears to be a very heterogeneous disorder, and that postmenopausal women themselves do not respond uniformly to any prophylactic intervention. No one regimen is likely to work for all. . . ." If one excludes those types of osteoporoses related to immobilization, endocrine and hepatic causes, those that are heparin related, and other iatrogenic types, including radiation osteonecrosis, one is left with a definable group of postmenopausal women for whom estrogen replacement therapy does, in fact, work in the prevention of hip fractures. Hutchinson, Polansky and Feinstein showed this in a statistically validated study using exogenous estrogens to protect

against fractures of the hip and distal radius. A protective effect was demonstrated with an odds ratio of 3.8 if administration was begun within five years of menopause.

In conclusion, I would state that I have no objection to whatever effective method an individual physician chooses to prevent the inevitable skeletal fragility and probable multiple fractures from which elderly women will almost assuredly suffer in time. The dilemma in my mind is not so much *how* to treat as it is the dire necessity of bringing to the attention of practicing physicians the overriding necessity of adequate prophylactic management. It is my belief that if we do not do something effective, this is another area which those who take pleasure in pillorying our profession will seize upon as an example of how we choose not to attempt to prevent disease, but only to treat after it has developed. I would not like to see the profession render any suspicion of substance to such an allegation.

ELMER E. SPECHT, MD
*Professor of Orthopedics and Rehabilitation
University of Oregon Health Science Center
Portland*